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Elin Rantakrans

Buying the Right Photo Equipment

70 Tips from the Top

edition espresso



Buying the Right Photo Equipment

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Elin Rantakrans

Buying the Right Photo Equipment

70 Tips from the Top

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A camera and a lens are the essential prerequisites for taking photos. Other accessories are not quite as important, but can nevertheless make taking pictures easier and more fun. The results often show just how much fun it can be.

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Some photographers simply enjoy taking photos, while for others the fun really starts once they have downloaded their images to a computer. The modern digital image processing workflow allows you to choose between software for differing skill levels as well as various types of Web galleries, printers, and photo papers for displaying your results.

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Introduction

Every keen photographer uses accessories, but the sheer amount of equipment available in today's market can make it difficult to find the right gadgets to fit your shooting style. This book takes a look at various pieces of essential and non-essential gear and describes how to find the best ways to either improve your new system or tune up your existing one. Do you need a new lens? Or maybe a flash? Or perhaps both?

Every photographer needs a certain amount of basic equipment, the same way a painter needs brushes, paint, and a canvas. All you really need to take a photo is a shoebox, a safety pin, black packing tape, and a whole lot of patience. But today, there are countless semi- and fully automatic cameras that offer increasingly refined ways to take pictures—although they cannot take pictures themselves, just as a brush cannot paint a picture on its own. A high-end, multi-megapixel camera with an enormous lens and a powerful battery grip does not automatically guarantee better photos, and it is always the photographer's job to get the best from the available equipment. Nevertheless, taking pictures is much more fun and you will get better results if you use the equipment and accessories that best match your ideas and your shooting style—just as a painter uses a thick brush to create the basic textures in a picture and a thin one for fine-tuning the details.



The challenge lies in deciding when to use which particular piece of equipment and what to leave out of the process. There are accessories for every conceivable situation available in photo stores and on the Internet, making it essential to consider exactly what kinds of photos you want to take before you make a purchase. If you want to take portraits without looking like a paparazzo, a 105 mm lens is definitely a better investment than a 400 mm telephoto, even if the longer lens might appear more attractive. If, however, you like to shoot outdoor and nature scenes, maybe the 400 mm lens is exactly what you need to capture that elusive dream image.

Photography can turn into an expensive hobby if you buy the wrong accessories, which will then end up languishing at the bottom of your bag or gathering dust in a cupboard.

This book uses real-world images to help you to find your way through the photo equipment jungle. Portraits, kids, nature, animals, architecture, vacation snaps, street scenes, macro subjects, and landscapes—every genre benefits from its own specialty paraphernalia. While some photos are easier to shoot using a compact camera, some require a high-end camera, and others can be captured using either. Notes in the text make it clear if an example relates specifically to a compact camera.

Have fun browsing!

Your lens determines various optical characteristics of your finished image, including sharpness, brilliance, and color rendition. Popular wisdom tells us that the number of megapixels is the deciding factor when it comes to image quality, whereas it is really the lens.



CHOOSING A LENS





It isn't always possible to get as close to your subject as you would like, but you can still bring your subject nearer if you use a powerful telephoto lens like the 300 mm one the photographer used here. //

PHOTO: HASSE HOLMBERG

1 Bringing distant subjects closer

Using telephoto lenses

You will often want to get a close-up shot of a subject without getting too near. If you are photographing wild animals, it is all too easy to scare them off, or simply to miss the right moment because you were concentrating on getting closer. You have to be ready to shoot the moment an opportunity arises, and catching the right moment often makes the difference between successful photos and duds. A high-quality telephoto lens with a wide maximum aperture is a great help. Telephoto focal lengths begin beyond 50 mm and allow you to keep a distance between yourself and your subject while still capturing sufficient detail.

Telephoto lenses can be heavy, so you will need to use a quality tripod if you want to be sure of shooting without camera shake. It is possible to shoot handheld using short telephoto lenses, but using a tripod is always safer. If you are purchasing a telephoto lens, consider purchasing a tripod too. This minimizes the risk of your new lens ending up unused because it is too heavy.

2 Increasing the feeling of space

Using wide-angle lenses

How can we increase the feeling of distance and spatial depth in a photo? The simplest way is to use a wide-angle lens. This makes spaces appear larger and more impressive than they really are—in contrast, telephoto lenses compress the photographed space and emphasize individual objects. Wide-angle lenses can give otherwise unimpressive scenes a feeling of depth and grandeur. Focal lengths of less than 50 mm are generally considered to be wide-angle.

Many documentary photographers use wide-angle lenses to give their images extra presence, and real estate agents often use the same trick to help them sell properties. But be warned: wide-angle lenses often produce unwanted distortion that can quickly become irritating to the viewer, especially when faces are photographed from close up.

A wide-angle lens increases the feeling of space and depth in an image. The wider the angle, the more pronounced the effect will be. // PHOTO: HASSE HOLMBERG



3 Be prepared

Using standard lenses

Standard lenses are perfect for shooting spontaneous photos. A standard lens usually has a focal length of 50 mm for a full-frame camera (see #6), although the standard zoom lens zone ranges between 28 and 85 mm (see #4). Standard lenses are compact and easily transportable, and have neither distinct wide-angle nor telephoto characteristics. They are equally effective for capturing close or distant subjects.



You can only produce great images if you are able to really “see” your subject. It’s possible to stare at an object for quite a while without actually seeing how it could make an effective photo. You also have to be ready to press the shutter-release button at exactly the right moment. Because they can be used at various distances without producing significant distortion, 50 mm or standard zoom lenses are great for shooting spontaneous family or vacation snapshots. Non-distorted images are always easy on the eye.



A standard lens is a reliable tool for producing a documentary look and feel in an image. // PHOTO: ELIN RANTAKRANS



Zoom lenses are practical, although they can be quite unwieldy. In this photo, the photographer zoomed during the exposure to enhance the dynamism of the finished image. //

PHOTO: HASSE HOLMBERG

4 Maximize your flexibility

Using zoom lenses

A zoom lens combines multiple focal lengths in a single lens and can be used to produce exciting and unusual effects. Zooming during an exposure produces a kind of soft filter effect that makes the subject appear neither pin sharp nor properly blurred. This effect gives a photo an interesting, dynamic feel. This type of shot is most effective if you use a long shutter speed to capture the zoom effect—your results will be sharp in the center of the frame and will include some motion blur at the edges. The longer the shutter speed you use, the stronger the effect will be. Here too, you can use a tripod to prevent unwanted camera shake.

The all-in-one nature of a zoom lens gives you maximum shooting flexibility, but at the price of increased weight compared to fixed focal length lenses (see #6), which require you to carry multiple lenses. Because it means you swap lenses less often, using a zoom lens also helps to prevent dirt entering the camera and landing on the image sensor. The quality of zoom lenses is constantly increasing and the differences in sharpness between zoom and non-zoom lenses are much less significant than they were a few years ago.

5 Discover new worlds Using macro lenses

Macro lenses are designed specifically for use at very close distances, but can also be used for shooting from farther away. You can experiment with close quarters photography using normal lenses with extension tubes or close-up lens attachments (see #7 and #25), but sooner or later you are sure to end up using a specialty lens.

105 mm macro lenses are effective, but are not long enough to completely blur a background. Focal lengths between 180 and 200 mm are better for controlling background effects and generally produce better flash results than shorter lenses. This is because the subject distance is greater, allowing the flash to light the scene more evenly. Because macro photos often require small apertures (f/11 or f/16) to keep depth of field workable, you will often need to use a flash to provide sufficient light.

Getting right up close gives you a new perspective on the world. Macro lenses offer a whole range of fantastic photographic possibilities. // PHOTO: ARI BYSTRÖM



6 Keeping things sharp

Using fixed focal length lenses

Fixed focal length lenses produce sharper images. They are also more light-sensitive than zoom lenses and don't wear out as quickly. // PHOTO: ARI BYSTRÖM





In contrast to zoom lenses (see [#4](#)), which have ranges of focal lengths (24–70 mm, for example), fixed focal length lenses have just a single focal length. This makes them more compact, and the smaller number of glass elements makes them more light-sensitive than zoom lenses. Because the individual elements of a zoom lens are constantly being moved back and forth, they are also more prone to general wear and mechanical faults. Less expensive fixed focal length lenses generally produce sharper results than low-end zooms.

Most lenses produce maximum sharpness at around two f-stops below their maximum aperture. Whether you prefer to use fixed focal length lenses or a zoom, getting to know a lens and its foibles will help you to get better results. If you prefer the look of photos taken using fixed focal length lenses, then they are probably better suited to your shooting style. Choosing a lens is very much a matter of personal taste.



7 Adjusting the closest focusing distance

Using extension tubes

Extension tubes are a useful alternative to dedicated macro lenses (see #5). They are mounted between the camera body and the lens and increase the distance between the lens and the image sensor. This decreases the minimum focus distance of the lens you are using and produces a macro effect—in other words, the image on the sensor is larger than the object itself. Extension tubes are available in various lengths and can be combined to produce a range of different effects.

Extension tubes are most often used in macro situations, but can be used effectively in other situations, such as for shooting portraits. Some of the incident light will be lost due to the greater distance to the image sensor. However, the light meters built into most cameras compensate automatically when you are using extensions, so this is not usually a problem. The magnification factor produced by an extension tube can be calculated using the following formula:

Magnification = Tube length/Focal length

8 Increasing telephoto range

Using teleconverters

If you already own a telephoto lens that isn't quite powerful enough to capture the images you want and a new lens is too big or expensive, you can use a teleconverter to increase the range of your lens. Teleconverters usually have an enlargement factor of 1.4×, 1.7×, 2×, or 3×. A 1.4× converter will increase the effective focal length of a 300 mm lens to 420 mm (new focal length = standard focal length × conversion factor).

Teleconverters are not particularly effective when used with wide-angle or standard zoom lenses. They only begin to be really effective at focal lengths of 50 mm and more. Additionally, teleconverters increase the length of the light path to the image sensor, so using a 2× converter doubles the effective focal length of your lens but also reduces the effective maximum aperture by two f-stops. For example, a 2× converter used with a 300 mm lens gives you an effective focal length of 600 mm but reduces the maximum working aperture from f/2.8 to f/5.6. Teleconverters can also have adverse effects on autofocus systems, so check that your camera is working properly if you are using one.



If your telephoto lens isn't powerful enough, using a teleconverter increases effective focal length without reducing image quality. // PHOTO: HASSE HOLMBERG

A lens with a wide maximum aperture is often the only way to get satisfactory results in low light situations. //

PHOTO: ELIN RANTAKRANS



9 Shooting in low light

Using wide-aperture lenses

Surprisingly, this photo was taken without the use of a tripod or flash. Instead we used a relatively high ISO setting and a wide-aperture lens. If a situation makes it impossible to use your preferred equipment—for instance, in a zoo or a museum—you will have to use other tricks and techniques to get the results you are looking for. Simply increasing the ISO value increases the amount of visible image noise (i.e., the “graininess” of your image), so using a “fast,” wide-aperture lens is often the only practical alternative. Fast lenses make it relatively simple to produce adequate results, even in situations where it is quite dark.

Many standard zoom lenses (see [#4](#)) have a maximum aperture of $f/4$, whereas 50 mm standard lenses often have apertures as wide as $f/1.8$ or $f/1.4$. The smaller the number, the wider the aperture, which means that more light gets through to the sensor. The disadvantage of wide apertures is that they reduce depth of field. A wide maximum aperture is particularly important in telephoto lenses, as these require you to use short shutter speeds to prevent camera shake.



The extreme wide-angle effect produced by a fisheye lens not only emphasizes the spatial relations in an image, but also produces significant distortion. Fisheye lenses are great for producing unusual special effects. // PHOTO: TEGIOZ

10 Producing extreme spatial effects Using fisheye lenses

Some photo equipment is just right for experimenting and producing unusual effects, and can lead to the purchase of a piece of gear that is actually quite specialized. Fisheye lenses are a perfect example of this type of equipment. A fisheye produces extreme distortion, comparable perhaps to the effects you find in a “hall of mirrors” at an amusement park.

The photo reproduced above owes its effectiveness to the fisheye lens we used to shoot it. The lens allowed us to get right up close to the subject and to deliberately use distortion as part of the composition. You can even use a fisheye to shoot family portraits that include the entire living room. If you do use a fisheye to take photos of people, make sure that you position your subjects as close to the center of the frame as possible so that the distortion in the facial features doesn't end up looking too extreme.

11 Architects like straight lines

Perspective control (PC) lenses

Accurate horizontal and vertical lines are an important aspect of architectural photos. Capturing them successfully usually requires the use of special lenses that allow you to compensate for the converging lines and distorted perspective that normal lenses often produce. If you like to photograph architecture but you are not willing to invest in a large format camera, a perspective control (or “tilt/shift”) lens is a practical alternative. PC lenses allow you to perform perspective corrections using a 35 mm camera that are otherwise only possible using large format equipment.

The tilt/shift functionality built into a PC lens allows you to adjust the optical axis of your lens to produce realistic-looking perspective and non-converging verticals. Photographing architecture using “normal” lenses often results in photos of buildings that look as if they were designed by an architect who wasn’t quite sober. You can use PC lenses to shoot interiors and exteriors, and even for landscape photos. PC lenses are not exactly cheap but, at the end of the day, which worthwhile lens is?



To produce professional-looking architectural photographs, you need to use a PC lens that allows you to correct converging lines. //

PHOTO: TOBIAS HAGBERG



12 Fantastic landscapes

Using a 24 mm lens

Great landscape photos are characterized by great depth of field. The best way to maximize depth of field is to use a wide-angle lens set to a small aperture. Lenses with focal lengths of 24 mm and less produce much greater depth of field than telephoto lenses. You will need to use a tripod to ensure maximum sharpness, especially if you are using a long shutter speed. A simple optical rule states that the foreground and the background will be in sharp focus if you focus on an object that is positioned

A successful landscape image depends on the right light and, usually, a wide-angle lens. Dusk and dawn are ideal times of day for shooting this type of photo. // PHOTO: GREG KNAPP



about a third of the way between your camera and the background. The field of focus is always deeper behind than it is in front of the point of focus.

The prevailing light and the season are the most important aspects of a landscape photo. It doesn't matter how beautiful a landscape is in reality if you photograph it at the wrong moment. Remember, a camera captures the light and shade in a scene but not the mood of a situation. A landscape image will always appear more impressive if it includes a mix of light and shade or a dramatic element, such as stormy sky. Harsh midday sun is simply dull. A well-composed landscape photo simplifies the chaos of reality by concentrating the viewer's attention on a few important details.



Using a discrete, compact camera is a great way to capture spontaneous snaps when you are traveling in foreign countries. //

PHOTO: ELIN RANTAKRANS

13 The perfect focal length for travel photos

Using a 50 mm lens

The most important characteristic shared by all great photographers is the magical ability to be at the right place at the right time. Most opportunities don't wait, and it is all too easy to miss the ideal moment. Keeping a 50 mm (or equivalent) standard lens mounted on your camera is the best way to be prepared to take advantage of opportunities as they arise. Standard lenses produce virtually no distortion and offer great image quality at an affordable price. They are also compact and easy to handle.

Once you have learned to shoot well-composed photos using a standard lens, you will find it easier to branch out and use other focal lengths. Many photo courses begin using just a standard lens. The father of the street photography genre, Henri Cartier-Bresson, used a Leica with a 50 mm lens in order to remain inconspicuous while shooting most of his best-known images. If you are traveling abroad, using a small, unobtrusive camera is often a great way to make the most of spontaneous opportunities. Wielding a large, expensive-looking camera is not always the best way to gain the trust of strangers.

14 Minimizing distortion in portraits

Using a 105 mm lens

A short telephoto lens is the best tool for shooting portraits. Such a lens blurs backgrounds and prevents unwanted trees, street lamps, or other objects from appearing to grow out of your subject's head. Focal lengths of around 105 mm (or 70 mm equivalent for cameras with APS-C sensors) produce pleasing proportions and reduce distortion to a minimum in portraits, whether shot using a fixed focal length lens or a zoom. This focal length neither compresses nor distorts a face to an unusual degree. This type of lens allows you to shoot at a comfortable distance of two or three yards and gives you space to use additional flash if you need to. Focusing on your subject's eyes is a sure-fire way to get pleasing results, and remember: the further your subject is from the background, the more blurred the background will appear in the final image.





Shot using a classic 105 mm portrait lens—the subject's face appears well proportioned and the background is pleasantly blurred. //

PHOTO: ELIN RANTAKRANS



A 300 mm telephoto lens allows you to get as close a view of your subject as you would if you were using binoculars. //

PHOTO: HASSE HOLMBERG

15 Long lenses for getting right up close

Using a 300 mm lens

There are always situations in which a long telephoto lens is the best choice: for instance, picking out a misty mountaintop or a squirrel on a branch. If you were to use a wide-angle lens to shoot the same two subjects, you would end up with the landscape surrounding the mountain or a foreground full of the squirrel's surroundings. In this photo, the compression produced by the telephoto lens was deliberately used to separate the subject from the background. A wide-angle lens would have turned the squirrel into a tiny dot in the final image.

A 300 mm lens behaves like binoculars, giving you the ability to observe your subject from a distance. A photo like this depends on the framing, the colors, and the shapes it involves for its success. Your choice of lens will always depend on the mood you want to communicate and the details you wish to include or leave out to emphasize that mood.

16 Preventing unwanted reflections

Using a lens hood

Lens hoods take up a fair amount of space in your photo bag, but are still worth their weight in gold. Shot without a lens hood, the image below would have turned out much less sharp and with unwanted reflections in all the wrong places. Lens hoods eliminate stray light and are especially useful for preventing the flare effects that spoil so many landscape images. They can be attached to the front of the lens to block the stray light that comes from lamps, windows, the sun, or any other extraneous source. Lens hoods also protect your lens and act as a kind of impromptu shock absorber should you accidentally drop your camera.

Lens hoods are usually made of metal, plastic, or rubber. Rubber lens hoods are often designed to fit standard lenses and can be folded down for transport. Many lenses have their own dedicated lens hoods. Lens hoods for telephoto lenses are much longer than their wide-angle counterparts, which have to be extremely broad at their open end in order to avoid producing vignetting effects (dark shadows at the edges of the frame). Lens hoods are only useful if they are attached to your lens, so don't leave them at home to save space in your camera bag.



A lens hood eliminates the stray light that causes unwanted reflections and excessive haze when you are shooting into the light. // PHOTO: TOBIAS HAGBERG

You can use Lensbaby lenses to produce just about any focus effect that you can imagine. //

PHOTO: MARTINA HOLMBERG

17 Creative images with variable focus

Using Lensbaby lenses

There are many situations in which we prefer to create unusual special effects rather than a technically perfect image. A conventional lens produces images in which all objects on or near the subject plane are in focus. But what if we want to portray just part of our subject in focus and the rest blurred? The solution here is to use a Lensbaby lens. Lensbaby manufactures a whole system of lenses that fit most modern cameras and allow you to locate the plane of focus wherever you want within the frame. Some Lensbaby models can be swiveled and shifted, while others can be compressed using built-in bellows to find the ideal point of focus.

The various Lensbaby models are made of different materials that produce a wide range of effects. The glass models produce images that are reminiscent of old-fashioned photos that are not quite in focus, while other, double-layer lenses produce pin-sharp images. Still others are made of plastic and produce impressive color effects. There is also a fisheye model and one that imitates a camera obscura, the first camera-like device that ever existed.





Filters are the simplest and most universal photographic tool, and influence the look of a photo directly. There are filters available for extending or moderating your exposure, as well as for creating special effects and intensifying colors. Filters can also be used to protect your lens from damage.



FILTER KNOW-HOW



In landscape photos that are dominated by the sky, using a graduated gray filter ensures that the exposure remains constant throughout the frame. //

PHOTO: BROOK PETERSON



18 Consistent exposure throughout the frame

Using a graduated gray (ND) filter

The sky is often much brighter than the rest of a landscape scene, so if you expose your shot for the landscape, you will end up overexposing the sky, which will then consist of just white, burned-out pixels. If, on the other hand, you expose for the sky, the rest of the landscape will end up too dark. In this case, the solution is to use a graduated gray (or neutral density/ND) filter to even out the exposure.

A graduated ND filter is a landscape photographer's best friend. It consists of a glass or plastic filter with a steplessly toned gradient that allows less light through the darker it gets. (A standard ND filter is colored uniformly.) The trick is to align the filter in front of your lens so that the gray part covers the sky and the clear part covers the rest of your landscape. This way, you can produce an even-looking exposure that emphasizes the deep blue of the sky while preserving detail in the rest of the frame. You can also simulate the effect of a graduated ND filter by taking multiple photos of your scene using different exposure values and merging them later on a computer using an image processing program. Digital merging techniques produce perfectly acceptable results, although using a filter is still a lot simpler.

19 Lengthening your exposure time

Using a gray (ND) filter

A long exposure was required to capture the movement in the water in the photo below and to get it looking silky soft. Such effects can be difficult to achieve, especially if bright sunlight prevents you from stopping the aperture down any further or if you are already working with the lowest ISO value your camera provides. In situations like this, you can use a gray/ND filter to block some of the light the same way sunglasses do.

ND filters are neutral gray in color and reduce the amount of light reaching the camera's sensor without influencing color rendition. The higher the filter factor (i.e., the strength of the filter), the less light it allows through and, as in our example, the more blurred the water will become in the final image. ND filters are also very useful if you want to emphasize your subject by using a large aperture to reduce depth of field and blur the background. Traditionally, gray filters are also used to reduce the risk of overexposure in snowscapes.

In this photo, a gray filter was used to artificially reduce the amount of light reaching the sensor, thus lengthening the exposure time and allowing the water to look pleasantly blurred. // PHOTO: SEBASTIAN ROMERT



20 No more fingerprints on the lens

Thanks to skylight filters



Nobody likes photos that are blurred due to a lens that is dirty, scratched, or covered in fingerprints. Nevertheless, this is a problem that occurs regularly, especially when you are taking photos of inquisitive young children. Photos of children only work if you shoot at “kid level,” and it is no surprise that a shiny lens is irresistible to all those tiny fingers. Children make great subjects because they behave in such a spontaneous way, but it is important not to lose patience if they become more interested in the camera than having their picture taken. Attaching a skylight filter is the simplest way to protect your lens from all sorts of dust and dirt.

A skylight filter protects the front element of your lens from dust, dirt, scratches, and inquisitive fingers. // PHOTO: HASSE HOLMBERG



A skylight filter mounted permanently on your lens is a useful protective measure, just like a UV filter (see [#22](#)). It prevents dust and dirt from settling on the lens and can also act as a shock absorber should you accidentally drop your camera. In contrast to a polarizing filter (see [#21](#)), a skylight filter has no effect on your exposure values. Skylight filters can also be used to prevent blue color casts and to keep skin tones natural-looking if you are shooting with an analog camera.



You can reduce the effects of reflections from smooth surfaces using a polarizing filter. Simply rotate the filter until you achieve your desired effect. // PHOTO: ELIN RANTAKRANS

21 Photographing through glass without reflections

Using a polarizing filter

Smooth surfaces—such as water, glass, or chrome on a car—reflect their surroundings. Using a polarizing filter is the simplest way to prevent reflections from spoiling your photos, and also allows you to effectively photograph through glass or down to the sea floor. A polarizing filter is constructed in two parts, and rotating the foremost ring adjusts the strength of the polarizing effect. You can see the effect in real time through your camera's viewfinder. If the filter has no visible effect, you can just as well remove it, as it absorbs some of the light entering the lens and influences exposure. By the way, polarizing filters cannot prevent the reflections produced by metallic surfaces.

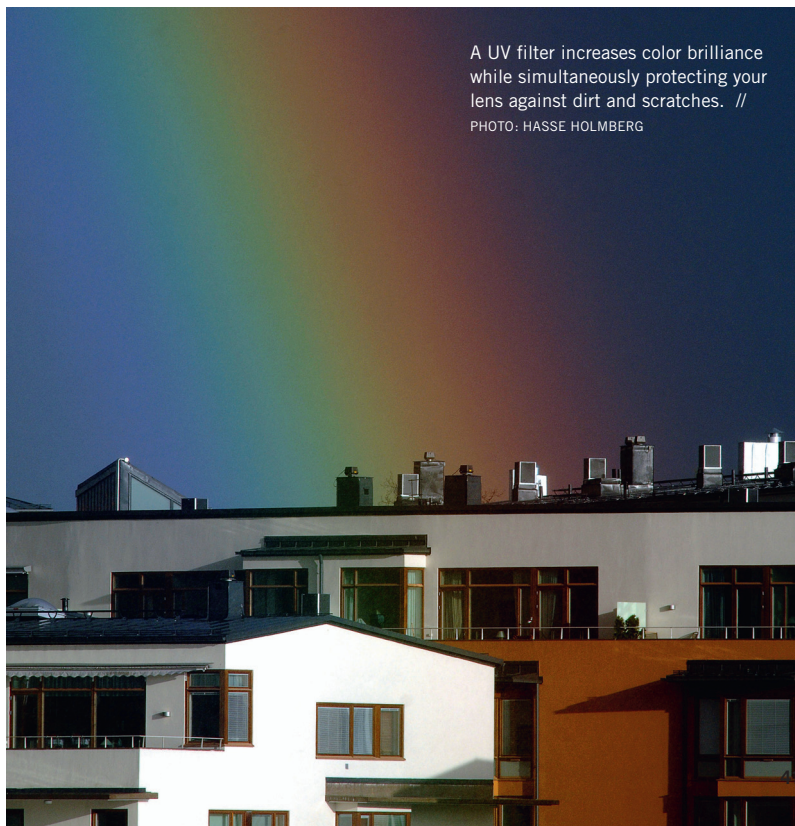
Polarizers also help to improve color rendition—clouds photographed using a polarizer are always well defined because the filter increases the contrast between sky and cloud while deepening the blue color of the sky. In other words, a polarizer gives landscapes (and other types of photos) a certain “something extra” by increasing contrast and enhancing color rendition.

22 Intensifying colors

Using a UV filter

Bright colors are always attractive to the human eye. We like to look at photos full of brilliant, lustrous colors, even if those colors didn't really exist at the moment the photo was taken. Post-processing on a computer is one way to give the colors in your photos an extra boost, but an even simpler method is to attach a UV filter to your lens while you are shooting. A UV filter doesn't affect exposure as strongly as a polarizer (see #21), but it intensifies the colors you can capture. It also reduces the potential decrease in sharpness that ultraviolet radiation can cause and protects your lens from dust, dirt, and scratches. A UV filter is a sure-fire way to avoid damaging your lens and ensures you many years of clear, sharp images.

A UV filter is the single most important lens accessory you can buy, and you can mount one permanently with confidence. Swapping out a scratched filter is cheaper than buying a new lens. Check that your filter has the same thread size as your lens to ensure a snug fit.



23 Shooting in mixed light

Using a white balance filter

Modern digital cameras have various built-in white balance settings that don't always match their descriptions as accurately as the manufacturers would have us believe. Additionally, automated camera settings don't always deal with changing light as effectively as we would like. This is especially true at dusk or in situations where cold fluorescent light is mixed with the warmer light produced by different types of incandescent light bulbs. In situations like this, a white balance filter is the answer (see #49).

A white balance filter is not a filter in the strictest sense and is, in fact, a piece of filter-shaped white plastic that can be used to manually adjust white balance. All you have to do is mount the filter on your lens and use your camera's custom white balance setting feature to measure and capture the temperature of the incident light. Using a manually metered value to take your photo will usually give you better results.



The only way to be sure of using the right white balance setting for multiple light sources is to adjust white balance manually. Here, a white balance filter is a useful aid. // PHOTO: MARTINA HOLMBERG



24 Adjusting a compact camera's lens range

Using telephoto and wide-angle accessory lenses

Some subjects are difficult to capture due to the simple fact that reality is three-dimensional, while a photo has only two dimensions to play with. Many photos can simply look flat and uninteresting. You can emphasize an object's size in comparison to its surroundings using a wide-angle accessory lens for your compact camera. Telephoto attachments help you to capture detail in distant subjects.

Telephoto and wide-angle lenses open up new worlds of possibilities for the owners of compact cameras. Accessory lenses can be mounted like a filter on the camera's built-in zoom lens. The biggest problem is that most accessory lenses only fit a specific camera or range of cameras from a particular manufacturer. Make sure the lens you are interested in fits your camera before making a purchase. As with all other lens attachments, accessory lenses reduce the amount of light entering the lens. The camera's automatic light metering systems will compensate for this, but the shutter speed will nevertheless be reduced.



A telephoto accessory lens attached to a compact camera allows you to get closer to your subject. // PHOTO: ARI BYSTRÖM



25 Shooting close-ups without an expensive specialty lens

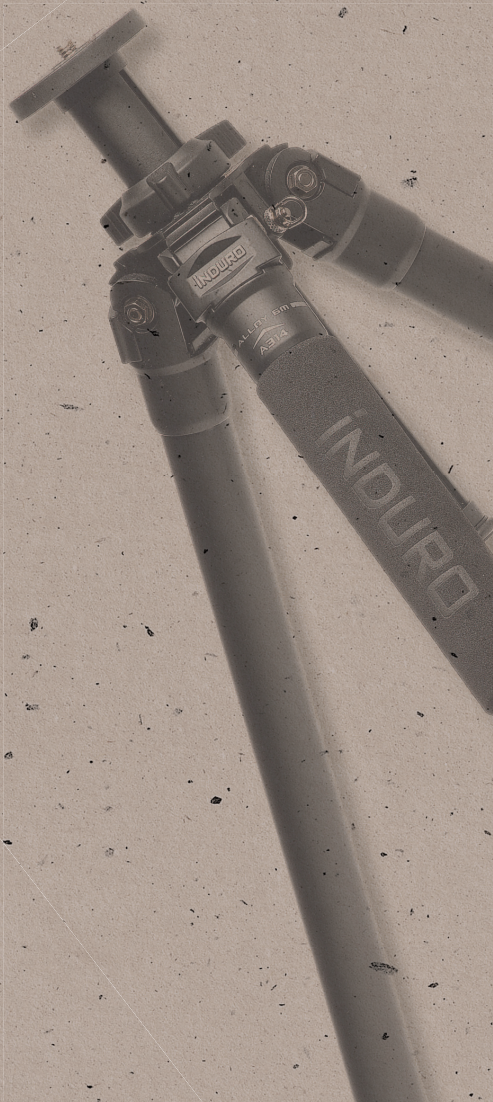
Using close-up lenses

Less adventurous photographers or those on a budget can still discover the wonderful world of macro photography by attaching a simple close-up lens to a compact camera and getting their knees dirty in the garden. That's how easy it can be to capture fantastic images. Close-up lenses shorten the focal length of the lens they are attached to, making it possible to focus at much closer distances than your lens would normally allow. Close-ups allow you to get closer to your subject, while true macro photos (see #5) capture extreme detail.

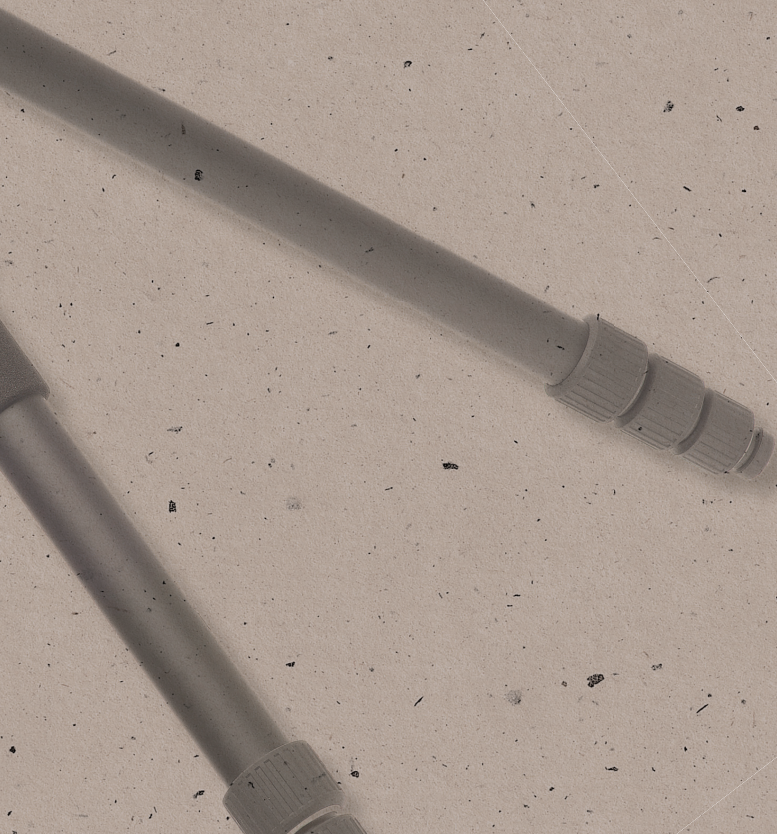
There are various things you have to watch out for when you are photographing plants and insects at close quarters. Because close-up depth of field is very shallow, it is always better to support your camera so that focus cannot get accidentally adjusted if the camera is jogged. Even if you don't have a tripod with you, leaning your camera against a rock, the ground, or your knee helps to prevent unwanted camera shake.

As with other lens attachments, the thread size of a close-up lens has to match the one built into the camera's lens. You can also use filter adapters to attach accessory lenses to some compacts.

If you shoot handheld using long exposures, your results will invariably turn out blurred. Even if your camera has a built-in image stabilizer, a stable tripod with an adjustable head will ensure that your photos turn out shake-free. The tripod you choose will depend on the subject and your personal shooting style.



USING A TRIPOD TO KEEP THINGS STEADY

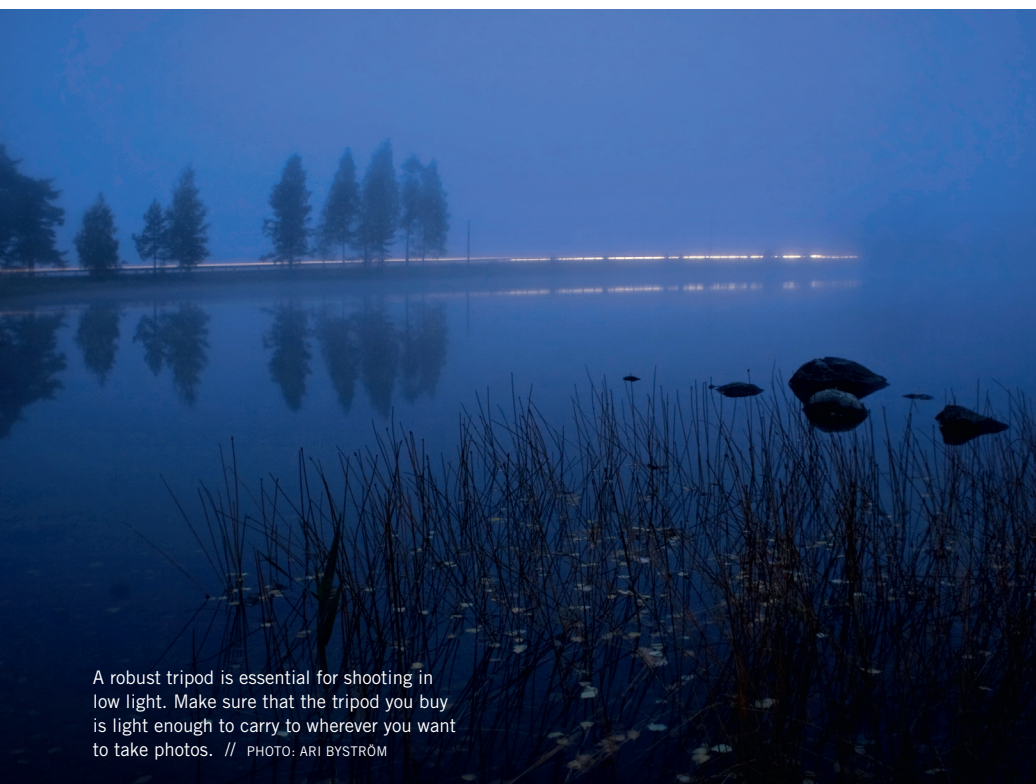


26 A stable base for your camera

Tripods

Low-light photos shot without flash require long shutter speeds to capture sufficient light. A tripod and a low ISO setting are essential in such situations if you want to avoid capturing an image that is full of noise artifacts. A tripod needs to be stable and requires an adjustable head that allows you to position the camera for portrait or landscape format photos (see [#28](#)).

A camera with a large lens attached can be quite heavy, so your tripod itself needs to be heavy enough to support your gear without the risk of wobbling or falling over. Generally, the more parts a tripod is constructed from, the less stable it will be. The problem here is that the heavier your tripod, the harder it will be to carry. Your choice will depend on whether you plan to use your tripod in a lot of different locations. Again, if you purchase equipment that is too heavy, you may end up leaving it at home, and that is no use to anyone.



A robust tripod is essential for shooting in low light. Make sure that the tripod you buy is light enough to carry to wherever you want to take photos. // PHOTO: ARI BYSTRÖM



Camera shake and motion blur are not the same thing. You can prevent the camera shake caused by long exposures by using a remote shutter release. // PHOTO: MARTINA HOLMBERG

27 Preventing camera shake

Using a remote shutter release

A remote release is essential if you want to avoid producing camera shake during long exposures. Conventional cable releases are attached directly to the shutter-release port and are operated by pressing the button at the end furthest from the camera. This helps to keep the camera stable while the shutter is being released. Remote control releases consist of a receiver that is attached to the camera and a release button that can be operated at a distance. This is a great tool for situations in which you can't or don't want to stay with your camera. High-end remote releases can be programmed to set focus or shoot bracketing sequences automatically, and some models have even more functions than that (see [#59](#)).

Camera shake is, by the way, not the same as motion blur. Camera shake occurs, as the name suggests, when the camera moves, whereas motion blur occurs when the subject moves—an effect that is often used deliberately. A tripod and remote release are essential if you want to accurately capture motion blur during a long exposure. Moving people are relatively easy to photograph using available light—situations that often lead to motion blur of the type that makes the photo above particularly interesting.

Taking photographs is even more fun if you use the right equipment. A ball head attached to your tripod makes it easier to discover new perspectives. // PHOTO: MARTINA HOLMBERG

28 Flexible tripod heads

Ball heads

A ball head for your tripod turns landscape photography into a real pleasure. Dawn and dusk are the best times of day for shooting landscapes, and using a quality tripod/head combo will help you to concentrate on capturing your image rather than on your equipment.

There are many different types of tripod heads available, but ball heads are by far the most versatile and are also the easiest to use. Using a ball head, you can adjust the angle of your camera to match the horizon at any time in one easy movement. Other types of tripods require you to make a series of tiny adjustments in both horizontal and vertical directions to achieve the same effect. Most quality tripod heads also have a quick release plate that allows you to mount and dismount your camera in seconds. Some tripods have a built-in spirit level (or bubble level) to help you fine-tune your adjustments, but if this isn't the case with your tripod, you can always acquire a small accessory level that fits to your camera's hot shoe.







A monopod helps you to keep your camera steady but mobile if you are using a heavy lens. //

PHOTO: TOBIAS HAGBERG

29 Support for heavy lenses

Using a monopod

A monopod is the ideal accessory if you are taking photos of sports or action scenes. It is easy to carry and offers the necessary stability and mobility for use with long telephoto lenses. A monopod is not always a practical alternative to using a tripod, as it is not quite as stable and doesn't allow you to completely let go of your camera. But a monopod is still great for making long, handheld exposures using large lenses, and keeps you mobile should you need to quickly change your position to follow the action.

Monopods can usually be attached directly to the thread on the support ring of a long telephoto lens without the use of a tripod head. Some sports events don't allow the use of tripods without special permission, so it can be useful to use a tripod head in conjunction with a monopod, especially if you need to maximize the flexibility of your camera's position.

30 Constructing panorama images

Using a panorama head

We recommend using a specialty panorama head and a tripod to help you keep the horizon in your panoramas level. For a panorama to be successful, the individual source images have to be accurately aligned and overlap in the right places. Specially constructed panorama heads are designed to help you shoot your entire sequence in such a way that all of your source images are arranged at the same angle to the optical center of your lens.

A panorama head consists of vertical and horizontal plates that you can shift to allow you to shoot in portrait or landscape mode. The camera



is attached to the plates so that it can be adjusted around the nodal point (i.e., the optical center of the lens). Locating the nodal point is the key to successful panoramas. Once you know where it is, you can locate it directly above the point of rotation of your tripod, making it simple to rotate the camera around the central point of the lens rather than the center of the camera, the way normal tripod heads do. Used correctly, a panorama head will help you to produce perfect panoramas using an image-processing program (see [#63](#)).



With the right flash and flash accessories, you can be sure of taking great pictures without irritating shadows or excessive contrast, whether you are shooting indoors or outdoors using fill flash. But don't forget to read the manual before you start shooting!



THE WORLD OF FLASH



A small accessory flash is easy to transport and allows you to take simple but creative shots, like this one that freezes the movement of the subject //

PHOTO: SEBASTIAN ROMERT



31 Freezing movement

Using portable accessory flash

The flash units built into many cameras often provide too little or too much light for the shot you are planning and aren't of much use for creative purposes. Accessory flash is much more flexible and is available in all sorts of shapes and sizes. We recommend that you purchase one made by the same manufacturer as your camera, as you can then be sure that the camera's metering systems will mesh with the flash. A unit that can be set up to produce low flash output is also very useful, and allows you to use subtle flash effects (fill flash) to reduce contrast and supplement natural light.

"Freezing" movements, like the water drop in the image above, is simpler than you might think, and requires just a little patience while you zero in on exactly the effect you are looking for. Use the fastest flash synchronization ("flash sync") speed that your camera allows (check the manual to find out the right value for your particular model), and make sure you use an aperture that provides sufficient depth of field to keep your main subject in focus. In the image reproduced here, a blue plastic folder was used to color the reflected flash. A die was then dropped repeatedly into the water using tweezers while the photographer focused manually on the spray. For shots like this, you can increase the drama and background contrast by coloring the water with food coloring. A reflective object (such as a gold ring) placed in the water refracts the light and produces an additional pattern on the water's surface.

32 Simulating daylight in a studio

Using studio flash

Working in a studio, the photographer has complete control over the situation, and no aspect of composition or color is left to chance. Most advertising images—from cars to cake—are shot in studios, where the main task is usually to make artificial light look as natural as possible. The most important piece of equipment here is a set of studio flash heads, although a cheaper alternative is to use adjustable, remotely controllable accessory flash units mounted on tripods or stands (see #33). Use one of your lights as a main light source and set this one up before using the others to provide fill light, accent, or additional background light.

The shutter speed you use and the characteristics of your additional lights will depend on the nature of your main light. If you are using a soft main light, your fill light should be soft too, regardless of whether you are photographing people or objects. The most important thing is to keep your studio light looking natural while retaining control over the look of your results. This way, you will avoid producing artificial-looking photos.



Studio flash offers virtually unlimited ways to shape and compose with light. //

PHOTO: MARTINA HOLMBERG

33 Adjusting flash to provide the right effect

Using a swivel flash unit

A flash unit that you can swivel and tilt is a great tool for producing creative portraits in indoor situations—and the bigger your flash, the better. Generally, the larger the flash unit, the more flexible it will be. If you can tilt your flash head 45 degrees upwards, you can reflect its light from the ceiling to produce a softer overall effect. You can also use accessory diffusers (see #35) to produce similar effects. Reflecting flash reduces the amount of light reaching the subject, so be sure to make some test shots before starting your “real” shoot. In a traditional studio portrait the best aperture to use is $f/8$ or $f/11$, in order for the face to have enough depth of field.

If you are using a swivel flash, it doesn’t matter if you shoot in portrait or landscape format, as you can always rotate the flash head to face the ceiling and diffuse its output. Some high-end flash units allow you to regulate flash output manually, giving you complete control over the effects you produce. You can also use multiple flash units in a way similar to a studio flash setup (see #32), but be warned: the larger your flash unit, the more battery power it requires. Using rechargeable batteries is a good idea if you use a lot of flash (see #52).

Swivel flash heads allow you
to direct your flash output
exactly where you need it. //

PHOTO: MARTINA HOLMBERG





Simple but very effective:
reflectors brighten shadows
and reduce contrast. //

PHOTO: MARTINA HOLMBERG

34 Controlling contrast

Using portable reflectors

Available light is often sufficient to produce great images, but tweaking contrast a little can still give a photo extra pizzazz. A simple but effective tool for doing just that is a foldable reflector. These are usually white on one side with a silver or gold coating on the other. The white side produces neutral reflections and can be used under most circumstances. The warmer tones produced by a gold reflector are more suited for portrait situations, especially outdoors. Silver reflectors produce a harder light that is better for use in indoor, flash-lit situations.

Reflectors are easy to fold up and carry and can be leaned against trees or walls or mounted on tripods and purpose-built stands. Take care to angle your reflector to direct the maximum possible amount of light at your subject. For example: use a reflector to brighten the shadow side of a portrait subject's face and reduce contrast. Or reflect light into your subject's eyes to make them sparkle, adding character to the finished image.

35 Making flash softer

Using a diffuser



A diffuser softens hard light from a flash, producing more natural-looking results. // PHOTO: ELIN RANTAKRANS

Flash is often too direct and too “hard,” and produces dark shadows that give an image too much contrast while still not giving any definition to the face. Direct flash should be avoided, and can give a photo an unprofessional look. If you want portraits to look flattering, soft light is always better.

Diffusers come in a variety of shapes and sizes, and most accessory flash units include a simple plastic diffuser that can be push-fitted onto the flash head. High-end diffusers look more like miniature softboxes and the rule of thumb here is: the larger the diffuser, the softer the light it will produce. As with most lighting accessories, diffusers reduce flash output, so you will have to experiment to find the right compromise between softness and brightness for your particular subject.



Flash mounted on a bracket can be adjusted to come from above the lens, even if you are shooting in portrait format. // PHOTO: MARTINA HOLMBERG

36 Keeping control of flash

Using a flash bracket

When it comes to producing professional-looking portraits, a flash bracket is a smart alternative to using a complex array of flash gear. Using flash with the camera held in portrait format often produces unattractive shadows beside the subject, but a flash bracket can help to eliminate this type of effect.

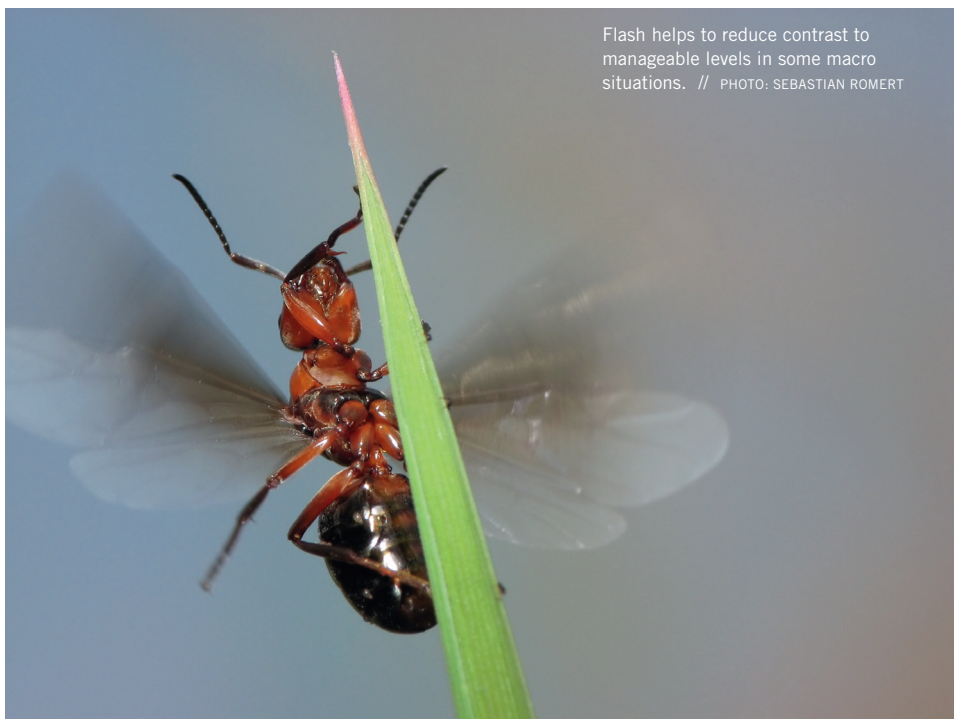
A flash bracket is an adjustable arm that attaches to the camera tripod socket and increases the distance (and the angle) between the flash unit and the lens, thus reducing the twin risks of unwanted shadows and red-eye effects. Flash brackets can be adjusted to keep the flash positioned above the lens, regardless of whether you are shooting in portrait or landscape format. This way, you can be sure that your flash comes from above and to the side of your subject, giving it a more natural look. And remember to connect the flash cable to the socket on your camera before you start to shoot!

37 Reducing flash contrast

Using ring flash

Ring flash is a useful tool if you are shooting macro photos using smaller apertures (f/11 or f/16) to increase depth of field or influence contrast. A ring flash is a flash unit that consists of a number of flash tubes arranged in a circular housing that attaches to the front of the lens. Ring flash produces images with minimal shadows and low contrast, making it highly suitable for fashion or macro applications.

Macro ring flash can be used at subject distances as close as one inch, although it can be tricky to find the right camera settings due to the enormous differences to exposure that tiny camera movements make. Newer LED macro lights provide continuous light and are a practical alternative to ring flash for close-up work. Be sure to switch off your camera's built-in flash when using ring flash, and set the shutter speed manually. If you don't immediately get the results you were hoping for, adjust the strength of your lighting, not your exposure values.



Flash helps to reduce contrast to manageable levels in some macro situations. // PHOTO: SEBASTIAN ROMERT

No camera, no photo. If you leave your camera at home because it's raining, you are sure to miss a lot of great photo opportunities. It's better to protect your camera properly while you're out and about than to not have it with you at all.



PROTECTING YOUR GEAR





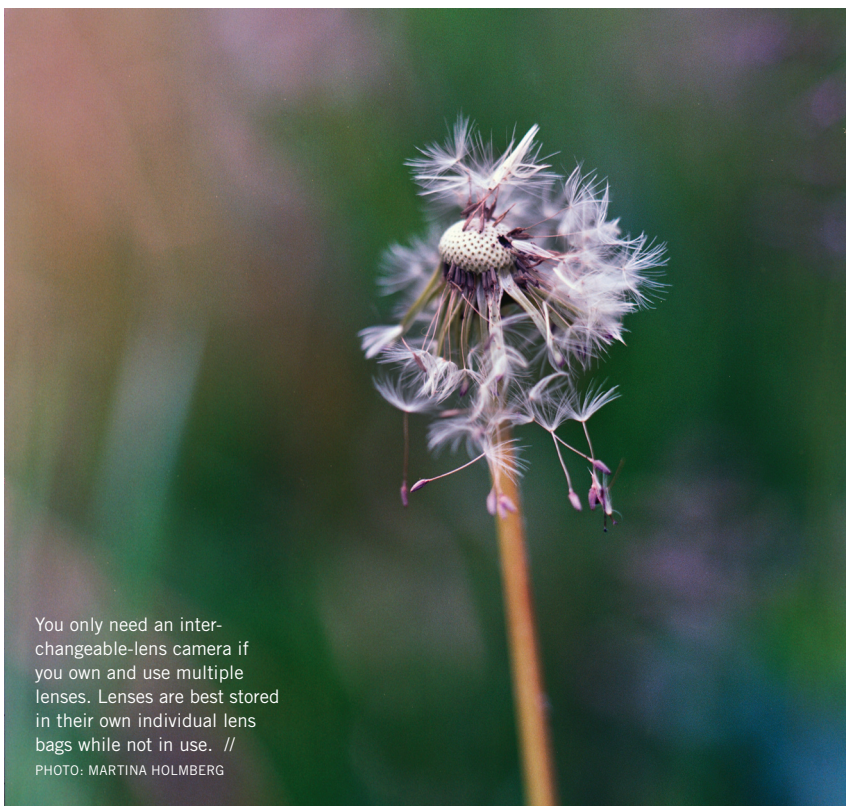
It is important that your photo bag sits comfortably and doesn't slip during long sessions. // PHOTO: TOBIAS HAGBERG

38 Safely stowed on the road

Bags and more

How do you carry your camera when you are out and about? Around your neck like a tourist? This does give you quick access whenever you need it, but offers no protection at all. If you take a lot of photos on trips or on vacation, a quality camera bag is definitely a worthwhile investment.

There are bags available for every taste and budget (see [#40](#) for more information on backpacks). Whichever model you choose, make sure that the shoulder strap is adjustable and that it sits comfortably. The bag itself should be adequately padded and lockable. In addition to providing protection, your bag should give you fast access to your gear when you need it. If you travel a lot, you might find that you need a selection of different bags that suit different lengths of trip and varying selections of equipment. Once again, it is essential that you feel comfortable with your chosen bag; otherwise, you might be tempted to leave it at home.



You only need an interchangeable-lens camera if you own and use multiple lenses. Lenses are best stored in their own individual lens bags while not in use. //

PHOTO: MARTINA HOLMBERG

39 Protecting your lenses

Using lens bags

Lenses are the most expensive and most delicate part of every photographer's equipment. While you might change your camera body every few years due to changes in technology or tempting second-hand prices, a quality lens will often last a lifetime. A strap around your neck is probably the easiest way to carry your camera body, but your lenses will lie around in your bag when they are not in use, and need to be protected against dust, damp, and the bumps and scratches of everyday photographic life. After all, it is the lens that determines the quality of your images.

It is especially important to ensure that your gear is adequately protected if you travel a lot and use only a light camera bag. Lenses should have lens caps at both ends and really need to be stored in their own individual bags if you want to be sure they are safe.

40 Both hands free

With a photo backpack

Anyone who likes to photograph landscapes, animals, or buildings has to carry their photo gear for long stretches at a time. If this includes you, a weatherproof photo backpack is the perfect companion. A full set of photo gear weighs a significant amount and feels like lead after just a few miles' trek. Backpacks spread the weight and are much better for your back than shoulder bags, especially if they are fitted with a waist belt that helps to take the weight off your shoulders.

The choice of backpacks is enormous, so take care to pick one that doesn't weigh too much before you pack it. If your backpack is too heavy, you will be tempted to leave essential gear at home. Pack your bag carefully so that the weight is distributed evenly and everything is easily accessible. Make sure that all zips, side pockets, and padding are arranged so that you can store everything safely.



On long treks, the best carrying option is a purpose-built photo backpack that evenly distributes the weight of your gear. //

PHOTO: TOBIAS HAGBERG

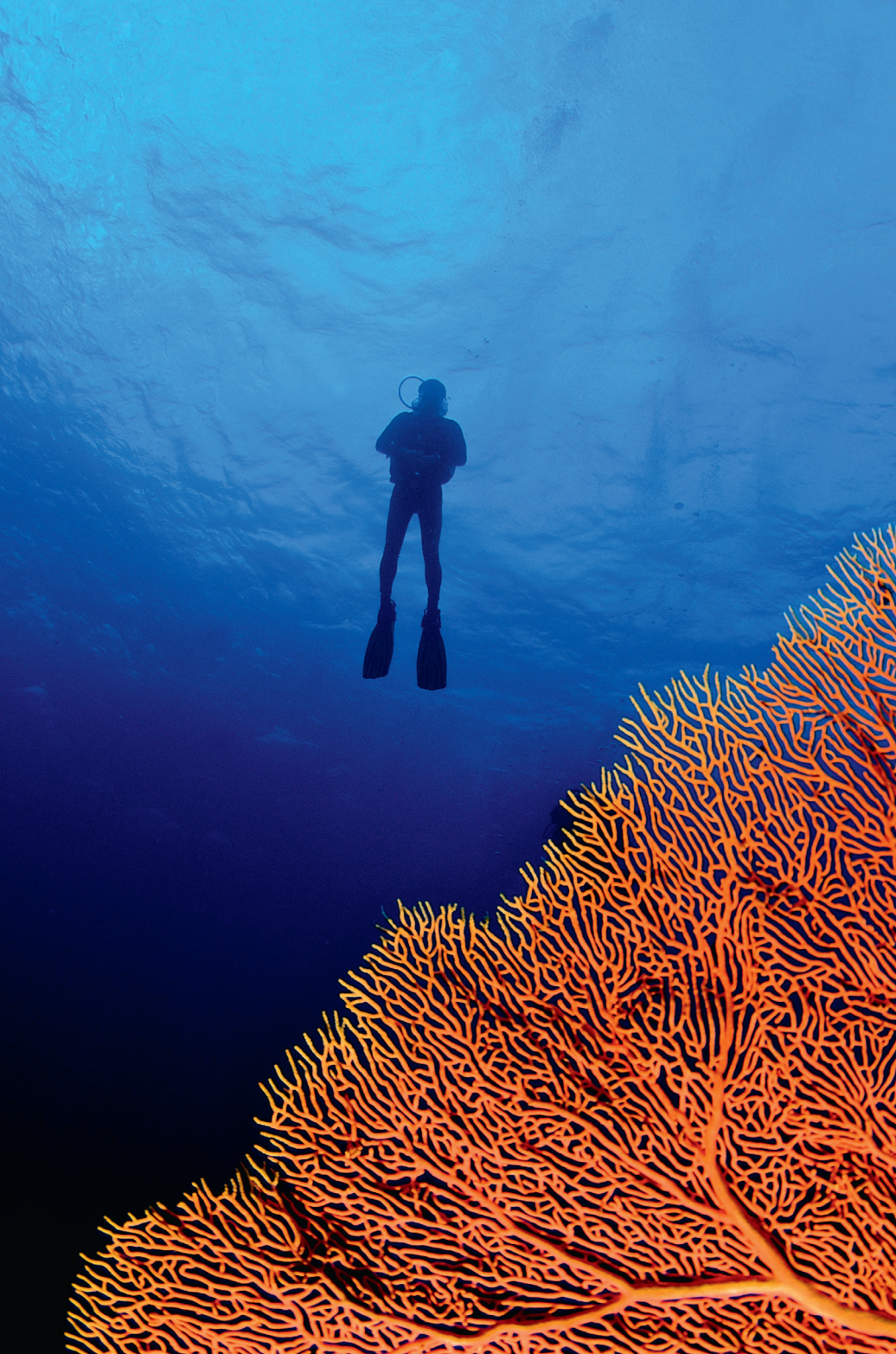
41 Diving with your camera

Using an underwater housing

Underwater photography is an art form of its own, and there is a wide range of specialty accessories available. Serious underwater enthusiasts often own a complete set of waterproof gear, including a waterproof camera housing, flash units, light meters, and all sorts of other bits and pieces that can cost thousands of dollars. Different situations require different combinations of components, but the one essential piece of equipment is a waterproof housing for your camera.

You can purchase a custom housing designed for use with your specific camera model or, alternatively, a simpler multi-purpose model that looks like a thick plastic bag or a mini diving suit. These types of housing are usually sufficiently waterproof to allow you to dive to depths of around 15 feet—which is enough to produce some fairly spectacular images. Housings for compact cameras are cheaper than those designed for use with DSLRs.

It gets dark quickly the deeper you dive and, due to the long shutter speeds required in low light, images that appear sharp on your camera's monitor are often blurred when you view them on dry land. If you are serious about capturing the wonderful colors of the world under water, you will sooner or later have to acquire a full set of specialist gear, including flash.





You have to keep the front element of your lens clean if you want to avoid traces of dust and dirt spoiling your images. // PHOTO: ELIN RANTAKRANS

42 Keeping your equipment clean

Using a camera cleaning kit

The simpler an image, the more obvious traces of dust on the lens or the sensor become. The photo above was only taken once the lens and the UV filter attached to it had been thoroughly cleaned (see [#22](#)). It is, of course, possible to retouch traces of dirt at the image processing stage, but who wants to spend time doing that if it isn't really necessary? Keeping your equipment clean is essential if you wish to produce spotless, professional-looking photos. Once again, the market offers a wide range of specially designed accessories for doing just that.

The most important cleaning tool is a soft cloth for cleaning your lens and your filters. A blower brush is also a great tool for gently removing dust from glass. We recommend that you have your sensor cleaned by an expert, but you can avoid dirt reaching the sensor in the first place if you take care when swapping lenses, especially in dusty or sandy environments. A protective transparent film stuck to your camera's monitor is a cheap and effective way to prevent scratches.

43 Outdoor camouflage

Using a purpose-built hide

Most wild animals flee the moment they see or sense people, and only show themselves again once the coast is clear. Using a camouflaged hide that only reveals the very front of your lens is the perfect way to get closer to shy subjects. A powerful telephoto lens and a tripod are also essential for getting a close view of your subject without scaring it away. A hide should be large enough for you to sit comfortably for long periods of time so that you are relaxed and ready to shoot when the right moment comes.

Using a camouflaged hide is the best way to give yourself a chance of capturing great photos of animals in the wild. // PHOTO: HASSE HOLMBERG



44 Braving the weather

Using a rain cover



Bad weather is no excuse for leaving your camera at home. In fact, rain often provides great photo opportunities if you protect your gear properly. Cameras and photo equipment are not made for bad weather—water and moisture, sand and dust are your gear's worst enemies. Protective covers are available for all sizes of cameras in different degrees of sturdiness and a whole range of colors. You can protect your camera from rain or cold, and some covers even keep your equipment dry if it ends up lying in water for a while.

Bad weather can provide you with a new view of familiar subjects. //

PHOTO: ARI BYSTRÖM



Shooting at dusk requires the use of a long shutter speed and a stable tripod. A tripod is easier to carry if you use a specially designed bag or strap. // PHOTO: SEBASTIAN ROMERT

45 Don't forget your tripod

Tripod bags

Tripods are cumbersome and are often left at home while other, lighter accessories get a trip out for nothing. The more robust a tripod is, the heavier it will be. It might appear over the top to put a tripod in a bag, but anyone who has spent time carrying a tripod will know just how exhausting it can be. A bag or strap allows you to sling your tripod over a shoulder and frees up your hands for the real work of taking photos. Some camera bags have special straps for attaching a tripod.

The photo above would not have been possible without a tripod. Shooting at dusk or dawn requires you to use long shutter speeds to make the most of the little light that is available. Using a small aperture increases depth of field and produces subtle light rays around the street lamps. Using a low ISO value reduces the risk of producing excessive image noise in the darker parts of an image during long exposures.

A camera and a lens are the essential prerequisites for taking photos. Other accessories are not quite as important, but can nevertheless make taking pictures easier and more fun. The results often show just how much fun it can be.

OTHER USEFUL ACCESSORIES



A light meter is the only reliable way to meter your exposure accurately in difficult lighting situations. // PHOTO: ELIN RANTAKRANS

46 Mastering difficult lighting

Using a light meter

Some subjects are more difficult than others to expose using your camera's built-in light meter. Subjects that are predominantly very bright or very dark, or those with very high contrast, often confuse the camera. In the image opposite, the contrast between the lightwell in the ceiling and the rest of the room requires very precise metering in order to produce a well-exposed image. Incorrect exposure cannot always be corrected digitally because pixels that are either burned out or missing cannot be retrieved.

For photo enthusiasts, a simple handheld light meter is an important aid to capturing "perfect" images. The camera's meter can only meter light reflected from a subject. Using a separate light meter, you can measure the incident light hitting your subject as well as any other light (flash, fill lights, etc.) that you are using. A light meter can also help to accurately judge exposure in critical situations like on a ski slope or at the beach in bright sunlight.







If a subject is lit using multiple light sources with differing color temperatures, some will need to be filtered to provide a neutral-looking result. Color temperature can be measured using a color meter. // PHOTO: ELIN RANTAKRANS

47 Controlling color rendition

Using a color meter

If a scene contains multiple light sources with different color temperatures, you will need to use special equipment to make your exposure. A typical example of such a situation is a room that is simultaneously lit by daylight coming through the windows, an incandescent light bulb in a table lamp, and a fluorescent light fixture attached to the ceiling. Setting the camera's white balance to correspond with the main light—in this case, daylight—will produce an image with a greenish color cast around the fluorescent light and a warm orange cast in the parts of the scene that are lit by the light bulb. Using Auto white balance will produce an image with random color casts covering the entire frame.

In situations like this, professional photographers use a color meter to measure the color temperatures of the various light sources. Then they place appropriately colored filters between the subject and the light sources that don't match the temperature of the main light. The gels used to filter light are usually hidden inside the individual light fixtures so that they cannot be seen in the final image.

Built-in meters often interpret the light in beach scenes wrongly and produce underexposed images. In cases like this, a gray card can help you to select the correct exposure values. //

PHOTO: ELIN RANTAKRANS



48 Helping a “confused” camera meter

Using a gray card

Subjects with dominant bright surfaces—such as a beach, a ski slope, or the sky—are difficult to expose correctly. The light meters built into cameras tend to underexpose these types of scenes, making them look dull and uninteresting. The bright light reflected from the sand in the image above caused the camera to select an aperture that was too small for the overall scene, thus underexposing the beach huts and making the final image darker than it needed to be.

The solution in this kind of situation is to use a gray card. A gray card is colored using an 18 percent gray tone, which is the middle step of a standard grayscale. The technique itself involves taking a frame-filling shot of the gray card while it is illuminated by the light in the scene you wish to photograph. You can then lock the exposure values that you meter for the gray card and use these to capture the scene. This technique takes the entire range of grayscale values into account and works just as well for color or black-and-white shots.

49 Setting white balance manually

Using a white card as a reference

Sometimes, a camera's automatic white balance system will spoil the mood of a photo taken in warm, early evening light. The success of a photo often depends not only on the subject and the composition, but also on the quality of the light illuminating the scene.

If you want to be sure that your camera reproduces colors exactly as you see them, you need to set white balance manually using a white card. A white card is used the same way as a gray card (see #48), but instead of measuring exposure, it measures the white balance produced by the ambient light. This technique only works if the light that illuminates the white card is the same as the light illuminating your subject. You can also use a white balance filter (see #23) to achieve the same effect.

A white card is a useful tool not only at dawn or dusk, but also in indoor situations with mixed light sources, for snowscapes, in predominantly green fields, or in any other situation in which there is a risk of a color cast spoiling your results.

For this photo, a manual white balance setting was necessary to ensure that the bride's dress appeared white. Using a white card is the quickest and simplest way to ensure accurate results. //

PHOTO: TOBIAS HAGBERG





50 Creating a neutral background

Using your own props

There are many different systems available for constructing a studio background, some of which have their own, dedicated stands, while others can be used with a variety of stands or tripods. Backgrounds that can be rolled up are practical and are a simple way to produce a seamless background with no ugly joins between the wall and the floor. An evenly lit white background often produces a feeling of weightlessness. To ensure that a background appears white and not gray, it has to be lit using light that is between $2\frac{2}{3}$ and a maximum of 3 f-stops brighter than the actual subject. The simplest way to achieve this effect is to aim a studio flash at the background (see #32), and then very carefully meter the background and subject light, respectively.

If you use a white background, you can illuminate it using any color you choose by placing a colored gel filter in front of the background flash. As a rule, colored backgrounds shouldn't be more than one full f-stop brighter or darker than the main subject—otherwise, the color will lose its intensity and end up looking muddy.

A simple white background offers endless lighting variations. //

PHOTO: JONAS UDD

51 Protecting your batteries from the cold

Always carry spares

Photos taken in cold weather are especially clear and crisp because cold air contains little or no humidity and therefore no haze. The major disadvantage of very cold weather (temperatures well below 32 degrees Fahrenheit) is that it significantly shortens battery life. There is usually no way to recharge batteries when you are out and about, so always carry a spare set of batteries when you are shooting outdoors in winter. Keep your spare batteries in an inside jacket pocket. Warm batteries hold their charge for much longer than cold ones.

Cameras, too, are more sensitive in the cold, and condensed human breath can cause a camera to freeze up if you are not careful. Always warm up a cold camera slowly to prevent the lens or other components from misting up.

Always take a spare set of batteries with you when you are shooting in very cold conditions. Cold batteries lose their charge much faster than warm ones. // PHOTO: TOBIAS HAGBERG



52 Keep your batteries ready for action

Using a charger

All modern cameras and flash units require batteries to operate. Digital cameras and electronic flash units use a lot of power, so it is always a good idea to use rechargeable batteries, from both an environmental and an economic point of view. Carrying spare batteries and a charger means that you always have fresh batteries when you need them. Modern chargers are small and light—all you need is a power outlet to keep on shooting.

Make sure your charger is compatible with the voltage in the country you are planning to visit and, if necessary, buy a transformer or an adapter before you leave home.



Rechargeable batteries are great, as long as you remember to take your charger along too. Remember to take an adapter with you if you are travelling abroad. //

PHOTO: HASSE HOLMBERG



In the unlikely event that your camera fails while you are travelling, a portable hard disk with a built-in card reader provides a secure way of backing up your photos. // PHOTO: HASSE HOLMBERG

53 Back up your photos regularly

Using a portable hard disk or card reader

Always back up your images as soon as possible after shooting, whether at home or on the road. When your camera has captured the image of your dreams, you want to be sure to get it into the computer as well. This way, you can be sure to have a safe copy of all your best photos, even if your memory card breaks or—the worst possible case—your gear is stolen.

Some portable hard disks have built-in memory card readers and a monitor for displaying your images. Some people prefer to carry a notebook computer and download their photos directly to the hard disk using just a card reader. Removing the memory card from your camera and loading the images separately saves camera battery power and allows you to continue shooting while your other photos are downloading.



A battery grip gives your camera extra power in critical situations, such as when you are shooting rapid-fire sequences. //

PHOTO: DAVID ELMFELDT

54 Extra power for your camera

Using a battery grip

Another way to keep a power-hungry camera running is to use a battery grip. This useful accessory attaches directly to the camera and contains additional batteries that keep you up and running during long sessions or when you are shooting sequences in continuous mode. Continuous mode is great for capturing sports action, and allows you to choose the best image of the bunch later.

Battery grips also have an additional built-in shutter-release button for shooting in portrait format. The only disadvantage of a battery grip is that it makes the camera heavier and less easy to handle.

An eyecup blocks stray light and makes it easier to compose your image in the viewfinder. //

PHOTO: ELIN RANTAKRANS

55 Retaining a clear view

Using a viewfinder eyecup

If the sun is high in the sky, it can be difficult to make out the image in your camera's viewfinder and almost impossible to recognize details in the monitor. A rubber or plastic eyecup mounted in front of the viewfinder blocks stray light and makes it easier to see what's going on in the viewfinder. An eyecup is also a great aid for people who wear glasses, as the frames make it impossible to position your eye right up close to the viewfinder's glass.

Some eyepieces even have a built-in variable magnifier that enlarges a portion of the viewfinder image to simplify focusing. A larger, brighter viewfinder image also makes it easier to check depth of field using the camera's preview button before you shoot.





Always carry a spare memory card. You never know where you will be when the one you are using suddenly fills up. //

PHOTO: HASSE HOLMBERG

56 Always keep some memory in reserve

Using a spare memory card

It is impossible to tell in advance when you will run out of memory or—even worse—when a memory card will break. It is extremely unlikely that there will be a photo store around the next corner just as you run out of space. Memory-intensive subjects, such as young children, require you to shoot as many photos as possible at every available opportunity, making it virtually impossible to have too much memory capacity on hand. Kids are fantastic subjects, but sitting still isn't usually one of their strengths! Strangely, great photographic subjects have a habit of appearing at the moment you set your camera aside or just when your memory card is full.

Memory cards are available in a variety of sizes, with different transfer speeds, and in a wide range of price classes. A high transfer speed is extremely important if you are shooting fast-moving subjects. High capacity is not always an advantage—if your card breaks, you are more likely to lose a large amount of data. Nevertheless, if you prefer to shoot in RAW format, you will need a fair amount of capacity to store the large image files that result. Generally, it makes more sense to carry several small capacity cards than one large one.



Always carry a compact camera with you. That way, you never miss a great opportunity, even if you don't have your "main" camera with you. //

PHOTO: HASSE HOLMBERG

57 Constant companions

Compact cameras for everyday use

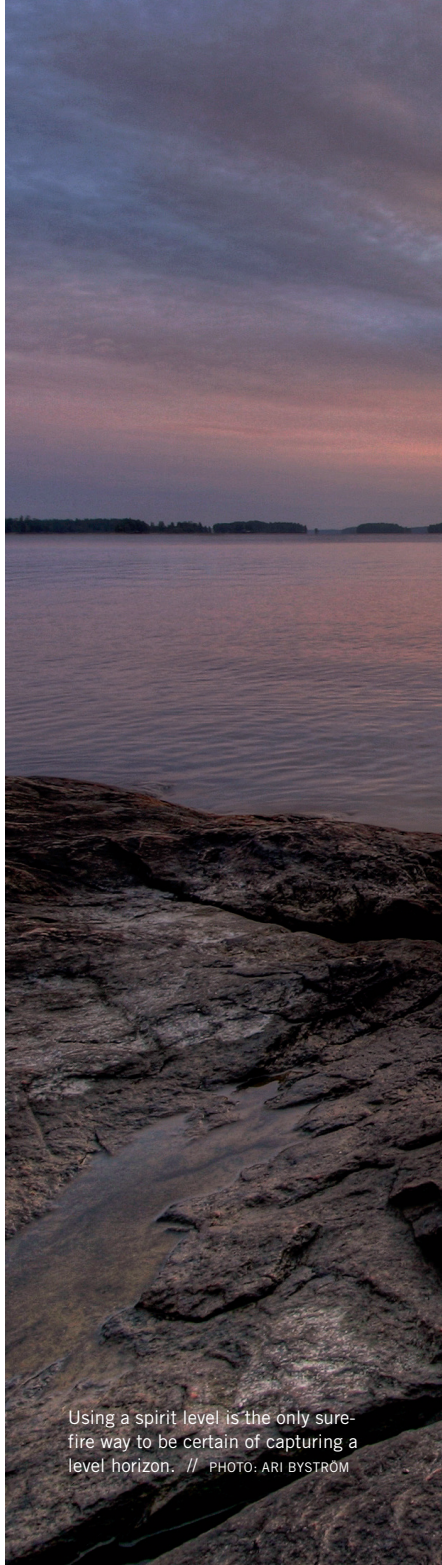
Some situations appear so quickly that you won't have time to get out your DSLR and prepare to take a shot. If you always have a compact camera set to semi-automatic in your jacket pocket, you will at least have a chance of capturing a fleeting moment when it occurs. Spontaneous snaps sometimes work out, and sometimes they don't. Compact cameras aren't always a poor alternative just because they are smaller, less flexible, and have fewer accessories. Small size and lightweight are great features in their own right.

Compact cameras are small enough to always have with you. A quality compact with some manual settings is a great addition to any DSLR system, and many of today's compacts produce really high quality images. Some compacts even allow you to mount an accessory flash. The small size of a compact allows you to shoot discretely and can provide you with opportunities that you wouldn't otherwise have with a "big gun" slung around your neck.

58 Keeping the horizon straight Using a spirit level

It is often the little details that make the difference between an adequate snap and a really successful photo. One accessory that helps you to get the details right is an accessory spirit level. This is a small plastic cube that you can attach to your camera's hot shoe and which allows you to accurately align your camera vertically as well as horizontally. A level horizon is essential in landscape photos if you want to avoid capturing lakes that look like rapids or birds that seem to be falling from the sky.

A level horizon is also an important element of every architectural photo. Photos of buildings that include converging or sloping lines present an irritating view and create the impression that the photographer wasn't concentrating.



Using a spirit level is the only sure-fire way to be certain of capturing a level horizon. // PHOTO: ARI BYSTRÖM



Using a wireless transmitter and
dedicated software, you can project
your camera's viewfinder image
directly onto a computer monitor. //

PHOTO: MARTINA HOLMBERG



59 Viewing the monitor image on a computer

Using a wireless transmitter

You can use a wireless transmitter and special software to display your camera's monitor image directly on a computer. This is a popular technique among portrait photographers, especially if they are working in a team with stylists and art directors who are all contributing to the results displayed on the screen.

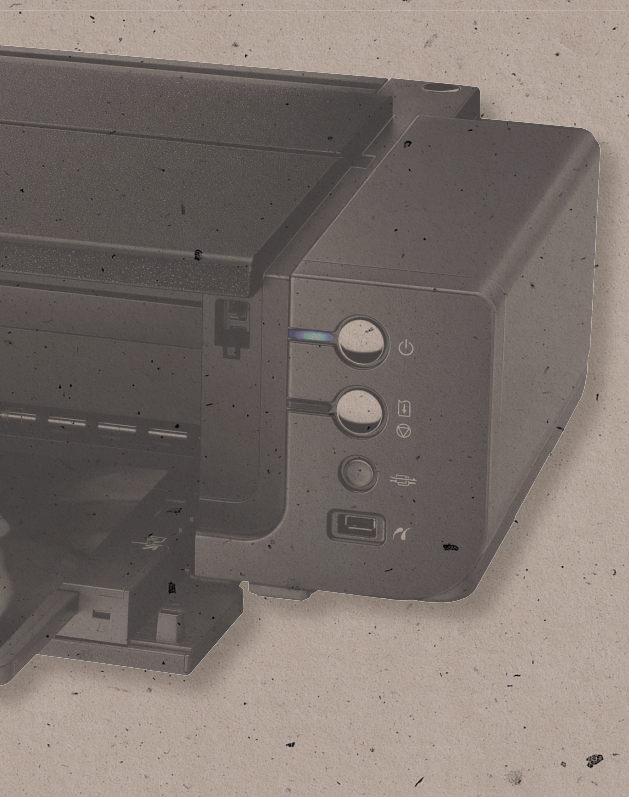
Some sports photographers use this technology to control multiple cameras remotely and to make automatic backups of their photos while they work. Newspaper and magazine editors can also use remotely transmitted data to view images in the office immediately after they have been shot in the field.

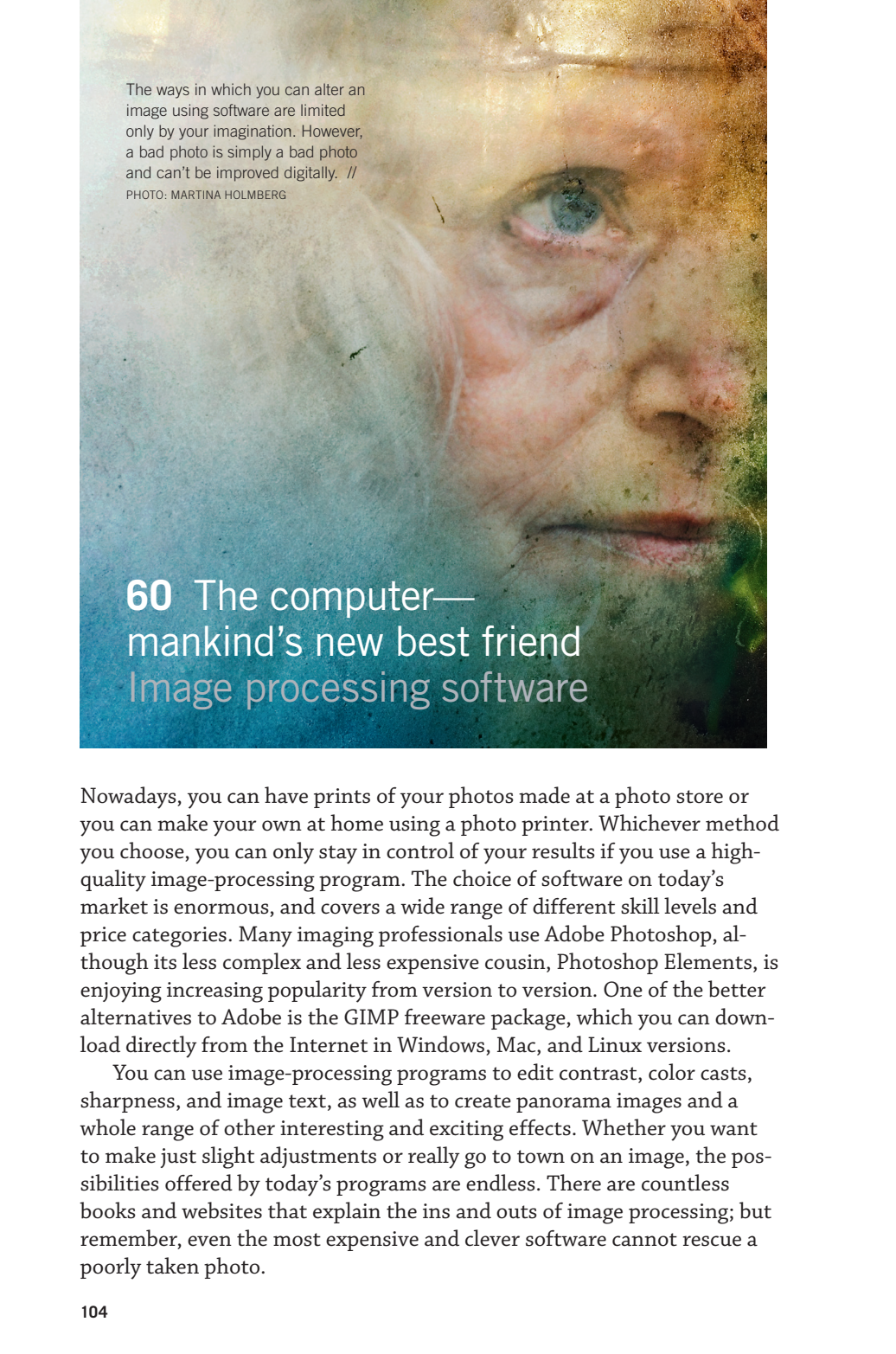
The transmitter is either attached directly to the camera or carried by the photographer on a belt or in a pocket. Software is available separately, but currently only for high-end DSLRs.

Some photographers simply enjoy taking photos, while for others the fun really starts once they have downloaded their images to a computer. The modern digital image processing workflow allows you to choose between software for differing skill levels as well as various types of Web galleries, printers, and photo papers to display your results.



THE DIGITAL DARKROOM





The ways in which you can alter an image using software are limited only by your imagination. However, a bad photo is simply a bad photo and can't be improved digitally. //

PHOTO: MARTINA HOLMBERG

60 The computer— mankind's new best friend Image processing software

Nowadays, you can have prints of your photos made at a photo store or you can make your own at home using a photo printer. Whichever method you choose, you can only stay in control of your results if you use a high-quality image-processing program. The choice of software on today's market is enormous, and covers a wide range of different skill levels and price categories. Many imaging professionals use Adobe Photoshop, although its less complex and less expensive cousin, Photoshop Elements, is enjoying increasing popularity from version to version. One of the better alternatives to Adobe is the GIMP freeware package, which you can download directly from the Internet in Windows, Mac, and Linux versions.

You can use image-processing programs to edit contrast, color casts, sharpness, and image text, as well as to create panorama images and a whole range of other interesting and exciting effects. Whether you want to make just slight adjustments or really go to town on an image, the possibilities offered by today's programs are endless. There are countless books and websites that explain the ins and outs of image processing; but remember, even the most expensive and clever software cannot rescue a poorly taken photo.

61 Digitizing your negatives

Using a scanner

The digital world also offers ways to process your old slides and negatives. Flatbed or purpose-built negative scanners can be used to create digital copies of color or black-and-white negatives and slides. You can make digital copies of prints, too, using a scanner attached directly to your computer like a printer. Scanned images exist in the form of digital image files that you can edit, alter, and print in exactly the same way as you can the image files generated by your digital camera.

Scanners vary in the quality and size of the image files they produce as well as the speed at which they work. Some scanners also include functionality that automatically removes scratches and traces of dust from your photos and negatives. Modern scanners no longer require a warm-up phase and are cheaper and more environment-friendly than earlier models. If you want to buy a scanner, make sure that the model you are considering is compatible with your particular system before making a purchase.

You can use a scanner to make digital copies of negatives, slides, and prints. // PHOTO: KARL-ERIK HAGBERG





62 Controlling the entire digital image-processing workflow Using a RAW converter



Setting your camera to RAW shooting format and installing a RAW converter on your computer gives you complete access to all of the image data your camera captures. //

PHOTO: HASSE HOLMBERG

If you want to exert maximum control over the entire image creation process the same way you were able to in a traditional darkroom, you need to switch your camera from JPEG to RAW shooting mode. RAW mode gives you access to all of the digital image data that the camera records. You will also need a RAW-compatible program, often known as a “RAW converter,” to edit your RAW image files.

The camera’s firmware does not automatically optimize RAW image data the way it does with JPEG images, which means that no image data is lost due to the action of compression algorithms or other automatic digitization processes. In other words, the image data is in a completely unprocessed state, hence the “RAW” filename. RAW data gives you much more scope for creative image editing than compressed JPEG data. RAW files are much larger than JPEG files, but leave you in charge of every step of the creative process.

63 Papering the walls with panoramas

Using stitching software

Using dedicated stitching software makes it much easier to merge your image sequences into finished panoramas. The resolution of a single image is not usually sufficient to produce wall-sized prints, whereas a panorama constructed of multiple source images can be printed out in very large formats. As with most specialty applications, there are many different stitching programs available, ranging from the freeware PTGui (for Mac and Windows) and Hugin (MAC, Windows, and Linux) packages to Adobe Photoshop, which also includes a number of stitching tools and functions. However, the most expensive software is not necessarily the best for the type of images you want to create.

Most current stitching programs are capable of correcting perspective, vignetting effects, color, contrast, and lens distortion. They are also able to identify unwanted objects in the overlapping areas between source images and removing them if necessary. Some programs can even counteract effects such as tree branches moving in the wind. Remember, if you want a finished panorama to look realistic, the source images must be shot at a consistent angle to the horizon. If the source images are not accurately aligned, parallax errors will cause anomalies in the vertical and horizontal lines within the scene (see #30). Even the most sophisticated stitching programs cannot effectively correct these types of errors.

If your camera's sensor resolution isn't sufficient to make large-format prints, you can use special "stitching" software to merge multiple source files into a single large image. // PHOTO: ELIN RANTAKRANS



64 Increasing the dynamic range of an image

Using HDR software





Digital cameras have a relatively low intrinsic dynamic range, making most images relatively high-contrast. High contrast often causes burned out highlights or swamped-looking shadows with no discernible detail. A relatively new way to increase dynamic range is to take multiple photos of a single subject using differing exposure values and to merge them into a single, high dynamic range (HDR) image using purpose-built software or plug-ins designed for use with other image processing programs. Be sure to use a tripod while shooting HDR source images—otherwise, you will have problems aligning the individual photos later on. Stationary subjects deliver the best HDR results, as moving subjects such as water or clouds tend to produce unwanted artifacts during merging. With dynamic subjects (or if you are shooting handheld), it is simpler to shoot a single RAW image and then convert it into two differently exposed HDR source images using a RAW converter.

Merging multiple source images using HDR software is an effective way to produce images with well-defined shadow and highlight detail. //

PHOTO: STEFAN JOHANSSON



If you don't organize your archives properly, it can be difficult to find the particular image you are looking for. Face recognition functionality is a great aid to searching for photos of people. //

PHOTO: MARTINA HOLMBERG

65 Organizing your images

Using image management software

It is impossible to remember every single photo you have ever taken. The solution to this problem is to use image management software. Adobe Photoshop Lightroom and Apple's Aperture and iPhoto are all examples of programs designed to help you sort, store, and find your images. These programs make it possible for you to create digital albums just like the old paper albums you used to keep. You can sort your images chronologically, into specific events, into themes, or into collections of different faces using face recognition functionality. Face recognition uses tags set by the user to recognize individual faces in new and archived images.

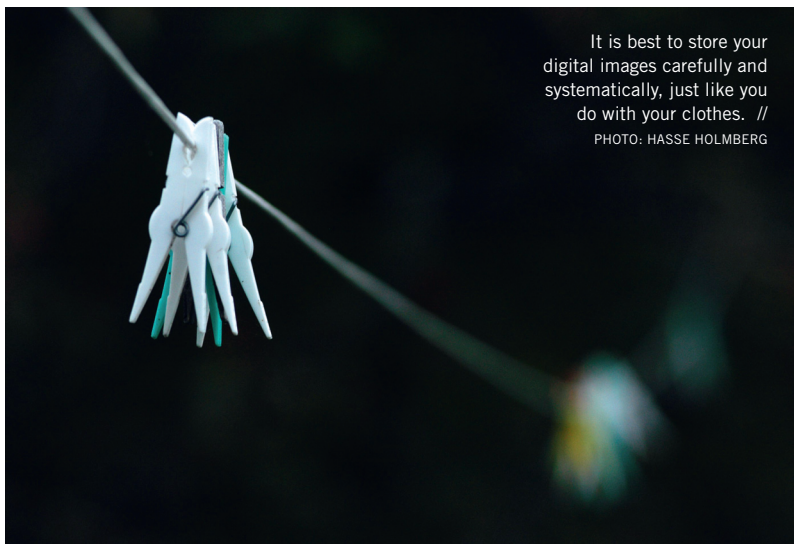
You can also create keywords for your images, making it easier to search for photos that relate to specific themes. Efficient image management is essential—what use is the best photo in the world if you can't find it?

66 Creating digital archives

Using external storage media

Most people look after their clothes carefully, storing them systematically in drawers and closets. We recommend that you do the same with your photos. Digital images keep best if you store them digitally too. Photo CDs degenerate over time, and you can never be certain how long a CD will last, irrespective of continual improvements in technology. The best currently available way to store digital image files is on an external hard disk. This method frees up space on your computer's built-in hard disk and ensures safe keeping for your images should your computer break or end up being stolen.

The price of an external hard disk depends on its capacity, which is usually stated in gigabytes (GB) or terabytes (TB). Giving your images multiple keywords, such as place names, people's names, objects, or the date, makes them easier to find later.



It is best to store your digital images carefully and systematically, just like you do with your clothes. //

PHOTO: HASSE HOLMBERG



A web gallery is a great way to share your photos with family and friends. // PHOTO: HASSE HOLMBERG

67 Presenting your images on the Internet

In a web gallery

You are sure to want to share your best images with other people, whether the images are of your latest vacation or your child's recent birthday party. A web gallery is the perfect way to share your experiences without having to stick prints in an album and invite people over to look at them. The great thing about web gallery sites is that you can limit access to invited guests or open your exhibition to the public at large.

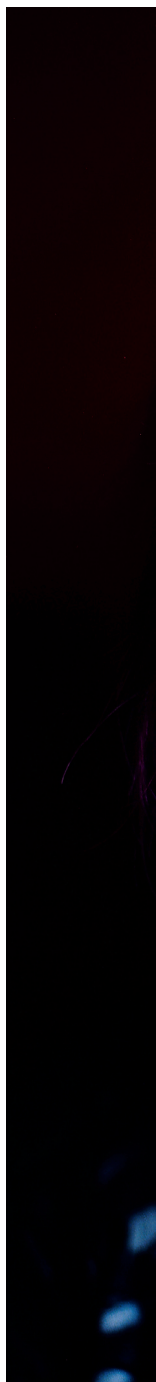
Photo portals offer different membership levels with various benefits, including online storage space for your images. This ensures that your images are stored safely, even if your own computer malfunctions. Most sites also include forums where photographers can discuss their work and exchange information. Some memberships are free, while others require a fee that depends on the amount of disk space you want to use. Two of the best-known photo sharing websites are www.flickr.com and www.smugmug.com.

68 Color matching your monitor and your prints

Using monitor calibration hard- and software

You are sure to want to know exactly how your prints will look before you actually click the “Print” button. If you don’t calibrate your monitor first, it is highly likely that the results that emerge from your printer won’t look like they did on your monitor. Prints often show color casts, too much contrast, or brightness that doesn’t correspond to your monitor image. You can calibrate a monitor using appropriate software and judging the results by eye or using a calibration device that sits on your monitor. Such a device evaluates the brightness, contrast, and color rendition of your monitor and adjusts their values automatically.

The cost of ink and photo paper wasted while making trial prints will soon pay for a calibrator, and your prints will all look fantastic.





A calibrator for your monitor is an environment-friendly investment. It helps you to get your prints looking exactly like the image on your monitor, saving you large amounts of ink and photo paper that you would otherwise use making trial prints. //

PHOTO: MARTINA HOLMBERG



A printer that uses multiple ink cartridges also saves money, as you only have to swap out the individual colors that are empty. //

PHOTO: ARI BYSTRÖM

69 Choosing a photo printer

Inkjet technology is improving fast

If you want to make prints at home that look as good as those that come back from the lab, you need to use a printer with at least six separate color cartridges. The minimum requirements for adequate color reproduction are the colors cyan, magenta, yellow, and black. Many current models also include extra inks for making blacks look really black and for improving subtle color differences such as those found in skin tones. Always use a printer that uses individual ink cartridges, as this allows you to swap out individual colors when they are empty, rather than having to dispose of half-empty, multi-color cartridges. Ink and paper—not the printer—are the most expensive parts of the print process. The quality of the ink and paper (see #70) affects color rendition, contrast, and the durability of the print.

Choose a printer that is capable of making prints that are larger than the ones you normally prefer to produce. This way, you still have some scope for making an extra-large print of the occasional “special” image.

70 Choosing your paper carefully

Normal and art grade photo paper

Your choice of photo paper will influence the color, contrast, sharpness, and durability of the prints you make, as well as your choice of printer (see #69). Some paper types work better with certain printers, so always check the manufacturer's specifications before deciding on your final printer/paper combination. You can always try out other alternatives later.

In addition to the different weights and sizes, paper is available with various surface textures, such as pearl, matte, glossy, high gloss, and a number of fine art types. High gloss paper, with its ability to produce rich blacks, is best for images that are intended for commercial use, whereas normal glossy paper is better for photos that you want to keep in albums. Increased surface texture, such as that found in pearl papers, produces a more intimate feeling but doesn't provide such sharp image definition, and is better suited for portraits. The larger your prints, the better the paper quality needs to be, especially if you want to display your prints in daylight. Daylight will cause all but the most durable inks to fade in time. Photos that you keep in albums are not as prone to fading and keep their original colors for longer.



What Equipment Do the Pros Use?

Most pro photographers have at least two different-sized camera bags. The main bag will usually contain two camera bodies, two flash units, and a range of lenses and accessories for use on big assignments. The other usually contains a single body, a couple of lenses and filters, and perhaps a flash for use on smaller or spontaneous jobs. Of course, every photographer will have his or her own favorite pieces of equipment, but an unwritten rule of thumb says that you should have at least two camera bodies with you at all times. This way, you are always ready to shoot using two different lenses, and you have a backup if one of your cameras should run out of power or break. The same rule applies to flash units—a second flash can act as a backup or as a fill light.

High-end cameras are often larger and heavier than mid-range or beginners' models, but are more robust and are capable of withstanding much more wear and tear. Some pro models are also protected against dust and dirt with rubber grommets and seals. The more your equipment costs, the more important it is to insure it against loss or damage. Check whether your house contents insurance covers your photo gear when you are out and about and, if it doesn't, ask your insurance rep if there are special policies or extra floaters available to cover your gear.

The following sections include some sample lists of the equipment used by various specialist pro photographers.

PRESS PHOTOGRAPHERS: At least two camera bodies, 12–24 mm, 24–70 mm, 70–200 mm, and 80–400 mm lenses, polarizing filters, UV and skylight filters, two flash units with adapters, an additional battery for shortening flash charge times, a flash bracket, a portable hard disk and card reader, a ball-head tripod, a monopod for use with large lenses, lens hoods, memory cards, spare batteries, connecting cables, and camera/lens cleaning gear.

SPORTS PHOTOGRAPHERS: At least two camera bodies, 12–24 mm, 24–70 mm, 70–200 mm, and 80–400 mm lenses, UV and skylight filters, a monopod for use with large lenses, a remote shutter-release, a portable hard disk and card reader, a laptop computer for transmitting images back to the office, lens hoods, rain covers, memory cards, spare batteries, connecting cables, and camera/lens cleaning gear.

PR PHOTOGRAPHERS: At least two camera bodies, 16–85 mm and 70–200 mm lenses, UV and skylight filters, two flash units with adapters and diffusers, flash heads with umbrella reflectors, an additional battery for shortening flash charge times, a flash bracket or stand, a portable hard disk and card reader, a ball-head tripod, a light meter, lens hoods, memory cards, spare batteries, connecting cables, and camera/lens cleaning gear.

ARCHITECTURAL PHOTOGRAPHERS: At least two camera bodies, a 24 mm PC (tilt/shift) lens, a large-format camera with various wide-angle lenses, a remote shutter-release, various gray (ND) filters, polarizing filters, UV and skylight filters, a portable hard disk and card reader, a ball-head tripod, a spirit level, lens hoods, a light meter, gray cards, white cards, a color meter, memory cards, spare batteries, and camera/lens cleaning gear.

LANDSCAPE PHOTOGRAPHERS: A photo backpack with at least two camera bodies, 10–24 mm or 14–24 mm wide-angle zoom lenses, a remote shutter-release, various gray (ND) filters, a graduated ND filter, polarizing filters, UV and skylight filters, a portable hard disk and card reader, a ball-head tripod, lens hoods, a light meter, gray cards, rain covers, memory cards, spare batteries, and camera/lens cleaning gear.

LOCATION PORTRAIT PHOTOGRAPHERS: At least two camera bodies, 16–85 mm, 50 mm and 70–200 mm lenses, UV and skylight filters, two flash units or flash heads, an additional battery for shortening flash charge times, flash brackets or stands, flash adapters and diffusers, a portable hard disk and card reader, a ball-head tripod, a light meter, lens hoods, memory cards, spare batteries, connecting cables, and camera/lens cleaning gear.

STUDIO-BASED PORTRAIT PHOTOGRAPHERS: Multiple 35 mm and medium-format camera bodies with a range of short telephoto lenses, UV and skylight filters, various effects filters, lens hoods, multiple flash units or battery-powered flash heads, a range of reflectors and diffusers, lamp stands, backgrounds, background supports, colored filters, a ball-head tripod, a computer, external hard disks, a light meter, spare batteries, connecting cables, and camera/lens cleaning gear.

STUDIO-BASED ADVERTISING PHOTOGRAPHERS: Multiple medium and large-format camera bodies with a range of short telephoto lenses, UV and skylight filters, various effects filters, lens hoods, multiple flash units or flash heads with batteries, a range of reflectors and diffusers, a heavy-duty studio tripod with sandbags, umbrella reflectors, backgrounds, background supports, colored filters, a shooting table, a ball-head tripod, a light meter, a remote shutter-release, a computer, external hard disks, spare batteries, connecting cables, and camera/lens cleaning gear.

VACATION PHOTOGRAPHERS: A compact camera, a DSLR body, a 24–120 mm lens with lens hood, a polarizing filter, UV and skylight filters, a flash unit with an adapter cable, a portable hard disk and card reader, a mini tripod, memory cards, spare batteries, a battery charger, connecting cables, and camera/lens cleaning gear.

Afterword

“Money will buy a bed but not sleep; amusements but not happiness;” and so on.

In just the same way, you can buy whatever photo equipment you like, but you have to provide the inspiration yourself. It is all too easy to shoot mediocre photos using expensive equipment, and it is always the individual creativity of the person behind the camera that counts in the end. The photographer has to find interesting subjects, make original compositions, and release the shutter at exactly the right moment. There is no technology and there are no accessories that can do these things for us.

So why do we need all this equipment at all? Does it really help? Of course it does! A new lens makes familiar subjects appear new and interesting, a polarizing filter makes landscapes more impressive, and the right bag makes even the heaviest tripod easier to carry. If a high-end lens is what you really want, save up for it and don't make compromises. Follow your instincts—if you use the equipment that best suits your personal style, you will be a happier, more productive photographer. The right equipment will also help you to concentrate on what's most important: looking, listening, planning, experimenting, and developing a feel for great images. And then you will be filled with the pure inspiration that money just can't buy.

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